

T-17J

February 14, 1996

Mr. Dave Ballman: 94-01298-IP-DLB
U.S. Army Corps of Engineers
St. Paul District
Army Corps of Engineers Centre
190 Fifth Street East
St. Paul, MN 55101-1638

RE: TAILINGS MANAGEMENT AREA FEASIBILITY REPORT/PLAN OF OPERATION

Dear Mr. Ballman:

As the U.S. Army Corps of Engineers (COE) is the lead federal agency regarding the proposed Crandon Mine site, I am forwarding you comments from the U.S. Environmental Protection Agency (EPA) regarding the Tailings Management Area Feasibility Report/Plan of Operation for the Crandon Mine Project, Crandon, Wisconsin. I apologize for not having these comments to you earlier to combine with the COE comments to Crandon Mining Company dated February 1, 1996. I have forwarded my comments to those listed below, but I would encourage you, as the lead federal agency, to incorporate these comments into yours as you see appropriate.

Below are comments from EPA based on a cursory review of the Tailings Management Area (TMA) Feasibility Report/Plan of Operation dated May 1995 with revisions dated October 25, 1995. The comments below are a combination of comments from different Divisions within EPA. A more extensive review will be performed once the TMA matters are settled and a "final" draft report is issued. Some of the comments below may have been addressed in one of the past TMA meetings, but are still included below because a revision of the TMA report has not yet been issued that reflects these comments. For the most part, specific design issues are not included since those aspects of the TMA report are still being discussed between the applicant and the Wisconsin Department of Natural Resources (WDNR) and final design specifications will be included in future reports. Also, comments regarding the TMA will also be included within reviews of other documents that were referenced throughout the TMA Report. Also, attached are comments previously made by the agency to the WDNR regarding the Wisconsin Pollutant Discharge Elimination System Permit Application since some of those comments relate to the TMA facility.

As a general note, in Section 1 (Introduction, Page 1, 2nd paragraph), it states that the TMA had been sited and designed, and will be operated to meet the performance objectives of providing an environmentally-secure facility which meets all applicable state and federal standards for groundwater, surface water, and air quality. While no regulatory agency can enforce standards more stringent than currently available, it seems by the language in this paragraph that the applicant is willing only to do what it has to do to get by the regulations, instead of stating and actually striving for meeting and exceeding all applicable state and federal standards. Also, it is mentioned throughout the document that common technologies from other mining operations will be used, yet, this one is not supposed to be like other mines (that have caused environmental problems) but due to new and improved technologies, this operation is touted as being state-of-the-art.

Section 2:

2.3.3: Mine Dewatering and Groundwater Inflow Control, Page 13, also Figures 2-8 and 2-9: To what extent is "local inflow control" (rock grouting), anticipated being used and what is the anticipated results? Fig 2-9 "Potential Bentonite or Cement Grout Barrier": to what does this term refer to in the text, to what extent will using grout barriers minimize infiltration over the life of the mine? Why are the lower portions of the ore body essentially excavated first and upper layers excavated last, would not excavation of the upper layers and subsequent backfilling and grouting minimize water infiltration into the mine during later years? If so how would this impact dewatering studies?

2.4: Infrastructure and 2.4.1: Water Treatment, Page 15: These sections list the infrastructure features to support the mine and milling operations, including a water treatment plant. The water treatment section states that sanitary water will also be generated at the facility and that it will be handled separately through a package sanitary water treatment plant with the treated effluent being pumped to the TMA. Where do the solid wastes from the sanitary treatment go? Will the treatment of this waste and adding this waste to the TMA add odors that are not addressed in this report or elsewhere? Are separate state or local permits needed for the TMA to be a sanitary waste fill? Is the amount of sanitary waste estimated to be disposed of in the TMA mentioned in any of the other documents? Is the design of the sanitary system outlined elsewhere? Will the system be designed to handle the waste from 750 employees or will mine workers use porta-johns, with wastes to be disposed of off-site and office workers wastes handled by the on-site system?

2.4.1: Water Treatment, Page 15: Design parameters for the water treatment ("contact" or mine waters) and sanitary water treatment need to be delineated. Options for disposal, other than in the TMA, for sulfide precipitation solids should be evaluated to lessen the amount of sulfur compounds within the TMA. Also why discharge treated sanitary wastewater, which may be high in oxygen

or low in buffering capacity, to the TMA? Alternatives need to be evaluated.

2.4.3: Preproduction Ore/Waste Rock Storage Areas, Pages 16,17: How will it be assumed that all rock classified as Type I has low potential for leaching; what percentage of rock will be tested? Is the determination based on visual? Where is this referenced?

The 2nd paragraph states that the pre-production ore storage area will consist of a compacted layer of existing soil overlain by a geomembrane liner, with a till cushion placed over the geomembrane. How long will Type II material be stored here? What is the thickness of the geomembrane liner? Compacted clay should be utilized instead of using the existing soils. For the construction material storage area, why can't the surface water runoff be diverted to the lined basin instead of being discharged to natural site drainage ways? Type I rock represents low potential for leaching but will the "low" amount of leaching still produce negative effects on local waterways? At a minimum, is a sedimentation basin proposed for this "natural drainage"?

2.4.4: Tailings Management Area, Page 17,18: This section should state what type of lab wastes and the quantity of lab wastes expected to be disposed of in the TMA. Is the lab waste hazardous? TMA laboratory comments covered under Section 4.1.1.4, the description of the laboratory, tests, reagents and solvents need to be delineated.

Page 18: The 1st paragraph states that tailings slurry will be transported via an aboveground HDPE pipeline. What measures are taken regarding freezing of the pipeline.

Page 18: The 2nd paragraph should inform the reader the philosophy as to why it is important to keep the tailings saturated.

2.4.6: Railroad Spur, Page 19: This section does not indicate what effects the 2.7 miles of spurline will cause to local drainage and how this will be dealt with. Is this dealt with elsewhere?

2.4.7: Utilities: There is no mention of sanitary utilities, so based on the comments above, it can be assumed that all sanitary wastes are treated on-site.

2.4.9: Surface Water Controls, Page 19: This section states that precipitation falling within the limits of the plant site will be collected and directed to one of a number of water storage basins and directed to the water treatment plant or to the TMA. Precipitation falling on storage areas for Type I rock should be classified as contact runoff and should be directed to the water treatment facility or TMA.

2.4.10: Wetland Mitigation, Page 20: Does the 29.5 acres include only the wetlands destroyed by the TMA or does it include wetlands or portions of wetlands destroyed and disturbed by the railroad spur, access road, discharge pipeline, etc.? It is unclear.

2.4.11: Mine Reclamation, Page 20: This section states that topsoil will be salvaged and stored from all disturbed areas for use in reclamation. It also states that the disturbed areas will be revegetated on a continual basis such that wind and water erosion potential is reduced. What about the storage area for the topsoil? Is this considered a disturbed area and will it be vegetated? Measures must be taken to avoid this storage pile(s) from being washed away into the nearby wetlands and streams.

This section, 3rd paragraph, also states that buried pipelines will be purged and left in place. Will they be grouted shut to avoid possible unnatural drainage conditions?

Section 3:

3.1.1: Unique Features, Page 21: This section should be expanded and at least include the NR definition of "unique features".

3.1.3: Minimization of Disturbance to Wetlands, Page 21-25: Table 3.1-1: On page 23, NR182.11(2)b states that the TMA should be located so that tailings pipelines do not cross major water courses or wetlands. Isn't the discharge line to the Wisconsin River considered part of the TMA piping since ultimately that is where TMA discharges will go? Also, by stating that the TMA complies to this section is somewhat deceiving since the TMA itself is filling in 22 acres of wetlands, so therefore the "piping" is not filling in the wetlands and therefore complies?.

3.2: Land Use, Pages 25-32: This section seriously lacks any information regarding the presence and uses of the land by the neighboring Native American Tribes. Sections here should make note of tribal agriculture including wild rice and subsistence food gathering including hunting.

Section 4:

Entire section is too brief. Reference needs to be made as to where more detail is to be found or it needs to be added here.

4.1.1.1: Waste Rock, Page 33: This section should state or reference the procedures in determining the identification of Type I vs Type II waste rock. The 2nd paragraph states that Type II rock may be used within the TMA in construction of the interior slopes. If this is the case, will the TMA liner be beneath the slopes or only be on top, up a portion of the exterior of the slope? Also, what will be the final cover over these interior slopes?

4.1.1.2: Tailings, Page 33: The last sentence of the 2nd paragraph states that only whole tailings will be pumped to the TMA. Please define "whole tailings" as compared to fine and coarse tailings? Why are the tailings different? Don't all go through the same process to extract the ore? Section 4.2 covers this somewhat. This section is confusing and should be clarified.

4.1.1.4: Laboratory Waste, Page 34: The types of expected laboratory wastes need to be listed here as well as the estimated quantities. Will the "insignificant volume" of the laboratory waste be compatible with the liner material?

4.2: Waste Characterization, Page 37: This section states that not all the waste characterization tests have been performed, that only the overview of the tests that have been performed to date are in this section. When will the remaining tests be completed and what tests are they?

4.2.1: Preparation of Tailings Materials, Page 38: This section states that coarse and fine tailings were sent to the lab for characterization, while the very end of section 4.2 states that only fine and whole tailings materials will be characterized. Section 4.2.1 then further states that whole tailings were produced by F&VD by proportionately recombining the two smaller tailings fractions. This does not seem to be a true recreation of the whole tailings because an extra rinsing would have occurred compared to a "true" whole tailing. True whole tailings should be analyzed to determine the true characteristics of whole tailings. Also, this section includes preparation of zinc, copper and lead concentrates; but the mine will also extract gold and silver. How will these concentrates affect the chemistry and why weren't they included?

4.2.3: Chemical Properties..., Page 40: 6-month test time frame is too short to fully evaluate the tailings.

4.2.4.1: Radiological Testing, Page 41: This section states that extensive radiological analysis were performed on the tailings, ore and waste rock. This section should reference these reports or a complete radiological report should be included as part of the EIR, summarizing all the current and past data supporting the claim that radioactivity is not an issue with this project.

Section 5:

5.1.1: Regional Topography, Page 43: Please correct the 3rd/4th sentences within the 2nd paragraph.

5.1.4.2: Regional Groundwater Flow System, Page 47,48: The 4th paragraph states that Figure 3.6-11 of the EIR was prepared in February 1982. This Figure should not only be included in this report and not just referenced, but should also be updated with data that is not 14 years old.

5.1.6: Regional Climatology-Meteorology, Page 49: The 3rd paragraph states that, in total, the historical average annual precipitation is 30.36 inches, and then the next sentence states that the region averages between 40-60 inches of snow/year. Is the snow average included in the total precipitation average? How much runoff does 40-60 inches of snow equate to over the TMA area?

5.1.7 and 5.1.8: Regional Terrestrial and Aquatic Biology, Pages 49-51: These sections should, or additional sections to these, should include the local biology and the direct effects of the TMA on it.

5.1.8: Regional Aquatic Biology, Page 50,51: The 1st full paragraph on Page 51 states that biologically, the Swamp Creek Watershed is connected only with the Wolf River watershed, and that there are no other surface water connections with any other watersheds via lakes or streams that would allow movements of fish, macroinvertebrates or other forms of aquatic biota between watersheds. It should therefore mention that this fact makes this ecosystem extremely more susceptible to population loss and disruption than areas that can have populations replenished from the outside. Same comment for the 3rd paragraph.

5.2.2: Existing Site Conditions Map, Page 53: Having the existing conditions map based on an aerial survey taken on April 28, 1976, 20 years ago, seems unacceptable. While actual contours of the land most likely have not changed except due to construction of roads or buildings, water level elevations of rivers, streams, wetlands, and lakes may have changed and the existence of wetlands or the size of the wetlands may have changed.

5.3: Groundwater Quality Validation, Page 67: The 1st paragraph states that in the vicinity of the TMA, groundwater generally occurs deeper than 40 feet below the land surface, while in Section 5.1.4.1, on page 47, the last sentence of the section states that at the TMA site, the depth to groundwater ranges from 60 to 130 feet.

5.3.1: Groundwater Quality Sample Collection Procedures, Page 68,69: Was a Quality Assurance Sampling Plan of any type developed for the sampling activities? Or is the applicant simply stating that the procedures were consistent with those published in the WDNR Guidelines?

5.3.2: Groundwater Quality, Page 70: Typo in 1st sentence; "waster" instead of "water".

Section 6:

6.2.2: TMA Waste Delivery System, Page 74: This section states that the waste characterizations of the waste streams destined for the TMA are described in "detail" in Section 4 of this report.

Section 4 does not contain "detail" but only seemingly brief summaries of the waste types.

6.2.2.1: Truck Transport of Mine Waste, Page 74,75: The last paragraph states that Type II rock will be generated over a period of about 31 years, but text and Table 4.1-2 state that the TMA will only be active for 28 years. Please clarify.

6.2.3.2: Pipeline Route, Page 75,76: This section incorrectly states that Drawing 2 shows the pipeline route. Drawing 2 only has the proposed haul road identified. Text should be changed to state that the all-weather pipe inspection and maintenance road mentioned in this section is the same as the haul road in Drawing 2, or the legend in Drawing 2 should make mention of this.

6.2.4: Tailings Distribution System, Pages 78,79: The 2nd and 3rd full paragraphs on page 79 seem to somewhat contradict each other. The 3rd paragraph states that the beach tailings will also be exposed to evaporation which will reduce the moisture content of the tailings, while the 2nd paragraph assures that reader that the tailings exposure time to the atmosphere will be limited and they will be flushed with process water as overlying tailings are deposited. Please clarify.

6.2.5: TMA Water Reclaim System, Page 79,80: How will waterfowl be discouraged away from this water pool?

6.3.1: TMA Liner Design - General, Page 85: The 2nd paragraph states that the liner on the cell bottoms (and partially up the interior side-slopes)... See Comment for section 4.1.1.1.

Based on information provided to date, there are no Resource Conservation and Recovery Act (RCRA) Subtitle C (Hazardous Waste Regulations) for the TMA. Solid Waste such as the tailings for the proposed mine are excluded from RCRA Subtitle C under CFR 40 §261.4. Therefore RCRA Subtitle C is not applicable. However, RCRA Solid Waste Subtitle D requirements are applicable to the TMA. CFR 40 §258.2 includes solid waste from mining operations. The bottom component of the proposed TMA liner contains only 12 inches of low permeability soil. This amount is deficient for RCRA Subtitle D requirements. CFR 40 §258.40(b) requires at least 2 feet of low permeability soil. Also, it is recommended that the applicant perform toxicity characteristic leaching procedure (TCLP) analysis on the tailings to confirm that the tailings are not hazardous under CFR 40 §261.24. The applicant has performed EP toxicity tests in the past but current confirmation on the toxicity of the tailings using the TCLP method is needed to determine if Subtitle C provisions would be more appropriate and relevant than using Subtitle D provisions.

Table 6.3-3: TMA Construction Clay Required from Off-Site, Page 91: This Table indicates that nearly 50,000 trucks hauling clay will be

on-site over a 34 year period, with the most traffic estimated at 7,500 in one year. As part of the potential effects of the TMA, an additional section (or an expansion of Section 6.10) needs to be included that evaluate what this traffic will do to neighboring areas, such as, results of additional dust deposition, added exhaust, burden to local roads, etc.

6.3.4.1: Materials, Page 92: This section gives the properties of a "generic" liner and states that the actual liner selected will be based on the "best available material economically available at the time of final design and construction". At what point is economics vs maximum protection separate? What will be the cutoff to state that this particular liner is not as good as this other one, but for the cost, it is good enough? Selection criteria needs to be stated up front.

6.3.4.2: Design Calculations, Page 92: The first bullet states that the geomembrane will need to be chemically resistant to the types of leachate likely to be produced. It also must be resistant to the types of laboratory wastes anticipated to be disposed of in TMA as well.

6.4.2: Design Rationale for Leachate Collection System, Page 95: An additional performance goal for the LCS should be to provide an access for leachate characterization sampling as a form of monitoring over the life of the TMA.

6.4.3.1: Leachate Drainage Layer and Filter Layer Design, Pages 95-96: This section should clarify that the drainage and filter layers are only for the cell bottom and not for the cell slopes.

6.4.7.1: Leachate Storage System During Post-Closure: Page 99: The 1st paragraph states that the reclaim pond will remain for about 10 years, until the post-closure leachate quantities decrease. After that time, it states that a leachate storage tank maybe installed for operation of the leachate management system during the remainder of the post-closure period. What other alternatives are CMC considering since they state a storage tank "maybe" installed? Also, by stating "the remainder of the post-closure period", it sounds as if CMC believes that leachate production will cease at sometime in the future or do they believe that responsibility for leachate collection after closure has an endpoint at sometime in the future? Needs clarification.

6.5.2: Initial Staging Berm, Pages 100-101: The 3rd bullet referring to Drawing No. 28, Detail 3-28 states that there are 3 pipelines shown in Detail "3-8". This detail only shows two pipes but detail 5-28 shows three pipes.

6.5.4: Freeboard, Pages 101-102: This section states that there will be 5 feet of freeboard. Does the penetration of the leachate pipes, as discussed in Section 6.4.7, through the freeboard, weaken

the integrity of the freeboard or make leaks more possible in times of high water? Can the leachate pipes be diverted over all the freeboard instead of passing through them?

6.6.2.2: Grading for Final Cover, Page 104-105: This section states that Type II rock may be used as a final grading layer prior to the final cover placement. Will the grading layer, at any point, pass over the areas that do not have a liner of any type. Usually, a final cover will feather out over the area that is filled to tie in with natural areas and if this occurs here, will the grading layer do so as well? If so, Type II rock is not the material that should be used for grading in these areas. No figures were referenced to answer this concern.

6.6.6: Rooting Layer Design, Page 106-107: This section proposes a 3-foot rooting zone stating that it is of adequate thickness for the expected plant species to establish roots and, to prevent roots from damaging the composite capping components. Nothing is said in this section on how the capping layers will keep burrowing animals from damaging the composite capping components. Animals such as the Woodchuck burrow down 4-5 feet. A layer of crushed rock can sometimes limit the damage that burrowing animals can cause to a cap.

6.6.10.1: Short-Term Shutdown, Page 108: The last sentence in the 2nd bullet should specify Type I waste rock. Also, if a longer-term shutdown (i.e., up to two years) occurs, what provisions would be taken to keep migratory water fowl and other wildlife away from the ponds? Would the ponded water be considered unhealthy for wildlife use, i.e., high metals, acidic, etc.?

6.7: Water Budget for the TMA - HELP Model: More extensive review of the HELP Model and the results will need to be conducted once the TMA design is completed.

6.12.2: Description of Site Development, Page 146: The 3rd paragraph, 1st sentence needs correcting, "... which follows portrays, to the" Also, the 3rd bullet's 2nd sentence is not complete.

6.12.2.1: Site Phasing, Pages 149-151: Bullets beneath Figure 6.12-1 heading are not all shown within the figure as the heading states. For example, Figure 6.12.1 does not show the last 4 (-). Same for some of the other figure references. Also, in the Figures, the cell numbers should be identified.

6.12.3.2: Mine Waste Rock, Page 152-153: Again, the method of determining the waste type should be cross-referenced. Also, see previous comments regarding concerns of uses of waste rock.

6.13: Typical Annual Waste Material Balances, Pages 160,161: Under the citation for NR182.08(2)(e)6.b., a reference is incorrectly

made to Section 6.2.10. The correct citation should be Section 6.6.10.1: Short-Term Shutdown and Section 6.6.10.2: Premature Closure.

6.14: Environmental Monitoring, Page 161: Why is such an important aspect of the TMA proposal (Environmental Monitoring) not given more detail within this plan? Specifics details, such as exact location of monitoring wells, need not be given but more of the strategy, purpose, goals, methods, etc., of the monitoring need to be discussed within this report.

6.17.1: Performance Evaluation - Groundwater Criteria, Pages 167-167b: Both the 1st paragraph on page 167 and the last paragraph on Page 167b state that, it can be concluded that the TMA will not cause an increase in groundwater concentrations to be harmful to the public health, safety or welfare. "Can be concluded" is too definite for a statement that cannot be readily proven. It should be replaced with something more on the order of: "Based on the information available to date, it appears that no increase in groundwater concentrations will occur that would be harmful to public health, safety or welfare."

6.18.2: Application of Parameters and Concepts, Pages 168-170: Under NR 182.11(2)(b), it states that the "intent" of the requirement is met. Does this mean that not all of the technical aspects are met, or that waivers of some sort were given? Please explain. Also, a figure or map would be helpful to visualize the TMA and its pipelines, access roads, etc., being labeled along with all water courses or wetlands.

Under NR 182.11(3)(b), it defines Type I rock as sulfide and Type II rock as non-sulfide. Isn't it the opposite?

Section 7:

7.2: Specifications for Site Construction, Pages 171-174: The introduction paragraph should state what is done in Construction Year 1 as it pertains to the TMA. For example, construction of the access road. If no construction in Year 1 then it should mention such, or start with Construction Year 1 instead of Year 2.

7.3.3: TMA Decant Water System Operation, Page 175: Automatic maintaining of a 3 to 5 foot deep water pool in the center of the TMA cell will not insure maximum limitations on tailing oxidation. This needs clarification.

7.4.3: Permanent Construction and Operating Records, Pages 181, 182: Even though not part of the requirement, in addition to the WDNR, other recipients of the Annual Report should be listed (such as the present distribution list for documents).

Section 10:

Section 10: Alternate Design, Location and Operations, Page 190: This entire section is inadequate. For instance, the last paragraph of Section 10.1.2 states "site 50" was eliminated for direct impacts, yet establishment of separate storage sites for potential high environmental impact solids was never evaluated. For example, water treatment sulfide sludge, sanitary water treatment sludge, lab wastes, or highly reactive tailings may justify short term impacts and logistical problems in establishing multiple sites. Also if remediation is needed at a later date discrete hydraulically isolated sites may prove superior to proposed site 40.

10.3.2.1: Sulfide Mineral Removal, Page 199: Capital costs must be balanced with long term benefits from TMA liner failure costs.

Section 10.3.2.6, Waste Conditioning, Page 202: Segregating and conditioning of only most reactive tailings was not addressed.

As stated above, further review of the TMA Feasibility Study/Plan of Operation will be conducted once the document is nearer finalization and more detail is available as to the TMA's location, capping proposal, monitoring systems, etc.

If you have any questions regarding the above comments, please do not hesitate to call me at (312)-886-7252.

Sincerely,

Daniel J. Cozza
U.S. EPA Crandon Project Team Manager

Attachment

cc: Herb Nelson, U.S.BIA
Mark Kuester, U.S.BIA
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